Heating • Piping and Air Conditioning

January-December, 1933—Vol. 5, Nos. 1-12

As will be noted, these abstracts are classified under several rather general heads. In searching for information on a specific subject, it will be well to look through the abstracts under the most suitable heading, and also to look through those under related headings. For example, some of the heating articles also contain information on air conditioning, and vice versa, *as the grouping has been made on the basis of the subject most prominently covered in the article.*

The index to the Journal Section *of the* American Society of Heating and Ventilating Engineers *is separate* (*see page* 641).

Air Conditioning—General

What Does the Term "Air Conditioning" Mean?
No. 7. *July*, 1933. *p.* 70 (*adv. section*).
Definition of *A. S. H. V. E. Guide;* comments of W. H. Driscoll; "ventilation" will come to mean air change only in plants, mines, toilets, etc.

Modern Equipment for Savings and Profit (Many Developments in Air Conditioning).
No. 1. *January*, 1933. *p.* 43.
Modernization with air conditioning and newly-developed equipment. 17 i.

Check Drives When Modernizing, by W. A. Meyer.
No. 4. *April*, 1933. *p.* 206.
Opportunities for modernizing pump, fan, and compressor drives. 2 i.

Reduces Air-Conditioning Costs with Compressor-Equipped Plant Storing Refrigerating Effect, by Charles S. Leopold.
No. 6. *June*, 1933. *p.* 296.
Comparison of ice and mechanical refrigeration plants should be made on same basis; storing refrigerating effect in compressor plants; restaurant plant stores ice, cuts peak load; brief description of apparatus; cost comparison of compressor ice-storage plant; need for further study to reduce air-conditioning costs. 1 i.

Control for a Steam-Jet Air-Conditioning System, by R. R. Houser.
No. 8. *August*, 1933. *p.* 399.
Six-ton steam-jet conditioning plant in Kansas City store; gas-fired boiler uses natural gas; control system and its operation explained in detail; fan controlled by time switch; amount of outdoor air controlled; allowing for occupancy; results secured with the system; diagram of equipment and control. 1 i.

A Decade of Progress in Motor Control Is Shown by These Jobs.
No. 12. *December*, 1933. *p.* 608.
View typical of control for fan and pump motors as installed ten years ago; view of similar equipment as installed now; improvements which have been made. 2 i.

Noise in Heating and Air Conditioning, by Samuel R. Lewis.
No. 4. *April*, 1933. *p.* 198.
Where it occurs; prevention; isolation of fan and motor; treating machinery room with absorbent; beam grillage to carry piping; noise from air flow; baffles; air-cleaning devices as noise bafflers; test of filter installation in radio-studio job. 1 i.

Effect of Water and Oil on Natural Cork Discussed.
No. 6. *June*, 1933. *p.* 305.
Natural cork used as sound isolation unaffected by water or oil (comment by B. A. Doane on article above); author's reply.

Testing the Fans for the East Boston Traffic Tunnel, by J. E. Gill.
No. 8. *August*, 1933. *p.* 414.
Brief description of tunnel and its ventilation; specifications for and testing of the 28 fans; small geometrically similar fan tested; flow-nozzle method of testing; test of full-size fan; exhaust fan-room tested; causes of losses. 3 i.

Specifications for Traffic Tunnel Fans.
No. 9. *September*, 1933. *p.* 73 (*adv. section*).
Comment by A. C. Davis on above article; author's reply.

Psychrometer Has Two Wet Bulbs.
No. 4. *April*, 1933. *p.* 206.
Bureau of Standards develops psychrometer for precise humidity measurements with two wet bulbs; amount of error; thermometric wet-bulb supply pre-cooled to evaporation temperature.

Air Conditioning—Commercial

Modernizes and Profits with Air Conditioning, by James M. Todd.
No. 1. *January*, 1933. *p.* 8.
Air-conditioning system installed in D. H. Holmes Co., department store, New Orleans, La.; cost; advantages obtained; cost of power cut; spaces conditioned; machinery room sound isolated; plant has 242-ton-capacity; pumps, fans, drives, control, cooling tower; air delivery; air to booths individually controlled; comfort zone in Southern climates and comfort chart. 5 i.

Unit-Type Air Conditioning System Modernizes Large Department Store, by A. W. Moulder.
No. 3. *March*, 1933. *p.* 137.
Unit-type cooling and dehumidifying system in Neiman-Marcus Company store, Dallas, Tex.; 50 units used; why unit system was chosen; all equipment is concealed; method of installation; ventilation; construction of units; non-freeze liquid circulated from central refrigeration plant; capacitor-type motors; connected motor load; system's features; results secured. 13 i.

17-Year-Old Office Building Meets Competition by Air Conditioning, by Ralph E. Phil'ips.
No. 5. *May*, 1933. *p.* 250.
Heard office building, Phoenix, Arizona; little space in building, equipment on roof; insulation; zoning of air-conditioning system; 150-ton ammonia refrigeration compressor; complete operating logs aid efficient operation (cut of log); connected motor load; power cost for one season; cost of air conditioning; advantages. 2 i.

Conditions Air for Six-Floor Tenant, by M. O'Connell.
No. 9. *September*, 1933. *p.* 463.
22 E. 40th St. building of New York Trust Co., New York City, modernized with air conditioning; steam-jet refrigeration; cooling tower saves on water cost; air distribution; dehumidifier on 7th floor; booster fan unit on each floor; cooling tower consists of air washer in basement; automatic control electric throughout; condenser water requirements at various temperatures; city water to help cooling tower over peaks; discharge of air from cooling tower; balancing inside-outside conditions; space required for air-conditioning plant. 7 i.

Radio City's British Empire Building Completely Air Conditioned, by André Merle.
No. 5. *May*, 1933. *p.* 239.
Six-story shop and office building; air conditioning system has three zones; duct-riser diagram; 300-ton steam-jet refrigeration unit; refrigeration equipment; chilled-water flow diagram and diagram of cold-water piping; pumping and controlling chilled water; condenser-water piping; cooling tower; wet-bulb type of humidity control; pipe shaft; air distribution and introduction; pH neutralizer; heat and sound insulation; ionization equipment. 8 i.

Distributing Conditioned Air in Dime Savings Bank Building, by Realto E. Cherne.
No. 10. *October*, 1933. *p.* 505.
Air conditioning of The Dime Savings Bank Bldg., Brooklyn, N. Y.; the building; dehumidifiers and supply fans; 92-ton centrifugal compressor; scheme of air distribution (safe-deposit department; main banking space); "high" and "low" distribution systems; compressed-air type control; indicating and recording instruments; operation of the plant. 4 i.

Flexibility a Feature of the Completely Conditioned Philadelphia Saving Fund Society Building, by Joseph M. Dowling.
No. 8. *August*, 1933. *p.* 409.
The building; zoning the system to hold sliding scale; conditions maintained; instruments; special outlets handle low-temperature air; scheme of air distribution; evaporative cooling conserves refrigeration power; cold-water piping layout; synchronous motors, cut-out couplings, correct power factor; cooling tower. 7-i.

Fan-Motor and Riser-Valve Control in a Partially-Air-Conditioned Building, by R. C. Allen.
No. 12. *December*, 1933. *p.* 603.
Gulf Building, Pittsburgh, Pa.; zone and clock control of steam; humidified air for lower floors; control of the fan motors; the question of air conditioning modern office buildings. 4 i.

New National Archives Building Conditioned to Protect Records.
No. 6. *June*, 1933. *p.* 305.
Air-treating system for National Archives Building, Washington, D. C., handles 330,000 cfm; the conditions maintained; advantages. 1 i.

Servicing the Air Filters for 140 Unit Ventilators, by W. H. Junker.
No. 6. *June*, 1933. *p.* 302.
Cincinnati & Suburban Bell Telephone Co. building; atmospheric dust in Cincinnati; need for filtered air; 140 units ventilate building; filter-cleaning equipment essential; how the filters are serviced; diagram and photo of servicing room and equipment; construction of cleaning equipment; pumps circulate cleaning fluid. 2 i.

Filtered Air Relieves Hay Fever, by William H. Welker, B. Z. Rappaport, and Tell Nelson.
No. 7. *July*, 1933. *p.* 348.
Research at College of Medicine of University of Illinois; problems in filtering air for removing pollen; leakage around filter; determining efficiency of filters; clinical observations on hay-fever patients; on pollen-asthma patients; filtered air gives relief and increases efficiency of hay-fever patients; pollen-asthma patients respond more slowly; summarized results of studies. 5 i.

St. Louis Center of "Cooling Belt,' Survey Indicates.
No. 7. *July*, 1933. *p.* 346.
Three maps prepared by Industrial Club of St. Louis show St. Louis to be near center of so-called "cooling belt." 3 i.

Millions Have Experienced Air Conditioning at the Chicago Fair.
No. 11. *November*, 1933. *p.* 558.
"Little Theater is Air Conditioned—Ten Compressor Units Provide 25-Ton Capacity," by G. E. Simons; "Gas-Fired Boiler Supplies 100-Lb Steam for Steam-Jet Air-Conditioning Unit at the Fair," by E. D. Quirke; "Time-Fortune Pavilion Has Provided Air-Conditioned Reading Room for Public Use"; "World's Smallest Theater Cooled with System having a Capacity of Four Tons"; "New High-Speed Railroad Coach on Exhibit; Air Conditioning Is Among Its Features." 4 i.

Large Air Volume Exhausted from "A Century of Progress" Buildings.
No. 5. *May*, 1933. *p.* 256.
Method of ventilating windowless exposition buildings; diagram of typical exhaust ventilation system. 5 i.

Chicago World's Fair Proves Air Conditioning Attracts the Public.
No. 7. *July*, 1933. *p.* 360.
Three-hundred seat theater is air conditioned; chemical company has conditioned display; air conditioning on display. 4 i.

A Century of Progress Exposition.
No. 6. *June*, 1933. *p.* 289.
Processes, not products, featured; exhibit shows generation, distribution, and utilization of electricity; air conditioned auditorium; electricity in industry; oil-line pumping station control; operation of a motor; air-filter exhibit; oil-burning equipment; development in piping and valves; other features; the buildings. 8 i.

Air Conditioning—Industrial

Air Conditioning Saves Six Years in Making World's Largest Mirror, by M. M. Lawler.
No. 11. *November*, 1933. *p.* 547.
Construction of 200-in. astronomical telescope at California Institute of Technology, Pasadena, Calif.; the mirror (weight, dimensions, use, etc.); glass sensitive to temperature changes; construction of mirror; advantages of controlled humidity; importance of air conditioning in testing; air-conditioning requirements; operation of conditioning system; electric heaters supply auxiliary heat; control; 60-ton refrigeration plant; methyl chloride compressor; filters; motor control; spray pond; insulation of piping, ducts, and housings. 6 i.

Movie-Makers Teach a Lesson in Product Improvement by Air Conditioning, by L. H. Polderman.
No. 6. *June*, 1933. *p.* 292.
Metro-Goldwyn-Mayer developing plant, Culver City, Calif.; air conditioning maintains production schedule; reasons for air conditioning; elimination of dust; prevention of static electricity; constant temperature and humidity; controlling temperature of developing solutions; air- and solution-control systems; humidity and temperature requirements; drying cabinets a part of the air conditioning system; control. 5 i.

Modernized Humidification Will Aid Textile Mills in Maintaining Profits, by George Fuller.
No. 8. *August*, 1933. *p.* 394.
Effect of *N. I. R. A.* code on cotton-textile industry; value of humidity control; what control means (examples); modern equipment, technique important.

Air Conditioning in the Modern Brewery, by L. L. Simmons.
No. 5. *May*, 1933. *p.* 245.
Ventilation needed for comfort; cooling a major problem; cooling requirements; unit coolers; exhausting carbon dioxide gas; need for bacteria-free air; close control of yeast storage; malting the grain; increased use of air conditioning probable. 1 i

Units Condition Concrete Testing Laboratory.
No. 2. *February*, 1933. *p.* 104.
Air conditioning units maintain constant conditions in Bureau of Reclamation's two laboratories in Denver, Colo.; concrete for Hoover Dam studied; removing heat generated by cement; method of obtaining close temperature and humidity control; electric strip heaters and atomizing humidifiers used. 2 i.

Many Economies Made by Using Air Conditioning in Ripening Fruits, by James J. Murray.
No. 7. *July*, 1933. *p.* 352.
Artificial ripening of tomatoes, bananas, etc., at Harry Becker Co. plant, Detroit, Mich.; the air-conditioning equipment; ethylene gas hastens ripening; advantages. 2 i.

The Drying of Solids, by T. K. Sherwood and E. W. Comings.
No. 4. *April*, 1933. *p.* 187.
Manner in which solids dry; initial adjustment period; constant-rate period; studying the drying of a solid; research at M. I. T.; six general types of drying-rate curves; equilibrium or hygroscopic moisture content; regain curves for keiselguhr, silk, and tobacco; relation of moisture content to drying time; example showing use of data given in an industrial drying problem. 5 i.

Cooling Water for Air Conditioning or Industrial Process Uses with Steam Jet Refrigeration, by Walter L. Fleisher.
No. 2. *February*, 1933. *p.* 77.
Steam and its temperatures; history of steam-jet refrigeration; how a steam ejector operates; pressure and temperature in the condenser; removal of air and inert gases; use of warm water from primary condenser; removal of cooled water; steam consumption; effect of ratio of compression; effect of condenser pressure; effect of initial steam pressure. 8 i.

Cooling Water for Industrial Uses with Steam-Ejector Refrigeration, by Walter L. Fleisher.
No. 3. *March*, 1933. *p.* 147.
Cool water for process influences plant location; estimating cost of water; refrigeration saves freight charges; locating equipment at point of cool-water use; steam-jet units for industrial air conditioning; steam for cooling aids boiler load; steam-ejector refrigeration not new; summary of features; limitations; modernization with steam-jet refrigeration; storing cold water.

Operation, Maintenance of Cloth-Screen Dust Collectors, by W. F. Terry.
No. 5. *May*, 1933. *p.* 259.
Dust collection; operation of dust-collection system; diagram of system; traps or separators grade dusts; importance of maintenance; cleaning the screens; rapping; emptying hoppers; disposal of dust; preventing air, water, and dust leaks; causes of screen wear, classifiers protect screens. 1 i.

Operation, Maintenance of Cloth Screen Dust Collectors, by W. F. Terry.
No. 6. *June*, 1933. *p.* 304.
Maintenance of arrester case; piping should be designed for easy maintenance; care of fans and motors; prevention of fire; advantages of regular general survey of plant; a schedule for inspection; summary.

Foundry Saves $6,000 Annually in Exhaust-Fan Bearing Maintenance, by Francis A. Westbrook.
No. 2. *February*, 1933. *p.* 94.
Ferro Machine and Foundry Co., Cleveland, O., modernizes 13 exhaust fans with dust-tight heavy-duty self-aligning adapter-type ball-bearings; service conditions severe; savings made. 1 i.

Industrial Fan Drives Offer Power-Saving Possibilities, by Robert W. Drake.
No. 12. *December*, 1933. *p.* 595.
Importance of power economy for pumps, fans, etc.; saving power in industrial exhaust and ventilating systems; how savings may be obtained; variation of motor speed; special fan runners; changing drive pulleys, sheaves, or sprockets. 3 i.

Modernizes Fan and Compressor Drives.
No. 2. *February*, 1933. *p.* 95.
(On the Job) automobile body plant modernizes flat belt drives by applying motor base to maintain proper tension in short-center flat-belt drive; advantages; new fan drive cuts slippage, saves power. 2 i.

Economy in Mine Ventilation.
No. 7. *July*, 1933. *p.* 347.
Engineering Experiment Station of University of Illinois reports results of study of mine ventilation in bulletin; the study and the results.

Heating—General

Modern Equipment for Savings and Profit (How Modern Heating Equipment Saves).
No. 1. *January*, 1933. *p.* 22.
Actual examples of modernization of heating systems in plants and buildings and recently-developed equipment; control cuts cost; stokers modernize plants; new types of radiation; modernizing with unit heaters. 38 i.

What Will Be the Future Development of Heating and Air Conditioning? by Willis H. Carrier.
No. 1. *January*, 1933. *p.* 16.
Developments in zoning heating systems, central-station steam, panel heating, concealed radiation, forced convection, fuel burning, distribution of conditioned air, refrigeration for air conditioning, and need of air conditioning, discussed.

Modernize the Term "Square Foot"? by Samuel R. Lewis.
No. 1. *January*, 1933. *p.* 15.
Adopt new term for square foot of steam and hot-water radiation?; new unit and its use discussed.

Data Sheets for Calculating Heating Surface for Buildings, by Price L. Rogers.
No. 4. *April*, 1933. *p.* 203 (*and consecutive issues through No.* 12, *December*, 1933).
Series of charts for computing heat losses from buildings for exposures up to 500 sq ft and coefficients from 0.02 to 1.12; chart for infiltration up to 26,400 cu ft; chart for proportionate heating surface required for other than conditions used as basis; and chart for pounds of steam and equivalent heating surface for heating domestic service water. Explanation of use appears in April issue. 9 full-page charts.

Design Temperatures for Heating Plants Based on a Fixed Overload, by L. C. Price.
No. 12. *December*, 1933. *p.* 598.
No hard-and-fast-rule for establishing design temperatures for heating plants; method using fixed percentage of overload; advantages; design temperatures for several cities.

A Method of Cleaning Radiators, by G. D. Winans.
No. 12. *December*, 1933. *p.* 607.
Thermostatic traps on radiators in large club building plugged with dirt; method of "vacuum cleaning" radiators devised; apparatus; results; how to prevent such trouble. 2 i.

Steam Generation in Boilers.
No. 11. *November*, 1933. *p.* 76 (*adv. section*).
Answer to question by Samuel R. Lewis on generation of steam in boilers burning solid and liquid fuel.

Control'ing Motors for Temperature Control Systems—Compressors—Oil Burners—Stokers, by Samuel R. Lewis.
No. 2. *February*, 1933. *p.* 100.
Operation of an electric temperature control system—positive operator, reversing operator; control of compressor motors; an oil-burner motor control; controlling stoker motors; controlling unit-heater fan motors; protection of motors. 7 i.

Heating and Ventilating Airplanes, by William E. Berchtold.
No. 8. *August*, 1933. *p.* 402.
The aircraft heating and ventilating problem; present methods of heating planes; liquid and vapor systems are promising; plane ventilation research needed. 3 i.

Heating — Buildings and Institutions (including Underground Piping)

(Also See "Modernization")

Hot-Water Heating for Skyscrapers, by T. S. Tenney.
No. 2. *February*, 1933. *p.* 82.
Heating system in Sixty Wall Tower Building, New York City; street steam drives turbines, exhaust heats water; use of condensation; six heating zones; top zone heated by humidified warm air; observation gallery can be cooled; flow mains divided for warm and cold exposures; heating surfaces enclosed; central control board aids operation; new developments make such systems possible. 5 i.

Control Reduces Steam Consumption 22 Per Cent, by W. H. Meloan.
No. 7. *July*, 1933. *p.* 351.
One saving can be superimposed upon another if they are not obtained by duplicating equipment; a case in point—the Consumers' building, Chicago; steam is purchased; control system installed; graph shows reduction in steam used for heating; careful operation and control tell. 1 i.

Application of Electric Heating to Office Buildings, by Lee P. Hynes.
No. 7. *July*, 1933. *p.* 358.
General office building of Kingsport Utilities Co., Kingsport, Tenn.; electric-heating and air-conditioning system; automatic regulation; ducts; auditorium; local office of Atlantic City Electric Co., Wildwood, N. J.; the electric-heating equipment and air filters; cost of operation. 11 i.

New Terminal Has Novel Features.
No. 7. *July*, 1933. *p.* 337.
Heating and ventilating systems of the Cincinnati Union Terminal (railroad); steam piped one mile from power house; ventilation systems; warm air circulated in extremely large double window; 14 units care for roof losses; heating the concourse; condensation from vestibule units is cooled by entering air; small movie theater is air-conditioned; brine-type dehumidifier; general features of the Terminal and history of development. 6 i.

Toledo Schools Expel High Heating Costs, by Samuel R. Lewis.
No. 1. *January*, 1933. *p.* 12.
Skillful operation of plant in Woodward high school cuts cost

from 95.1c per 1,000 cu ft for first season to 77.5c second season; first year with a stoker plant at DeVilbiss school; stokers increase capacity at Cherry school, enable heating of new Feilbach school, cut cost 75c per 1,000 cu ft; table showing cost of fuel for heating schools in various cities.

At University of Co'orado—Master Control Valves Save Steam, by W. E. Brockway and George S. Dobbins.
No. 11. *November*, 1933. *p.* 556.
Comparison of amount of steam required to heat buildings as it had been done in the past, and the amount required with a motorized valve on the main steam supply, actuated by a thermostat; plan of tests; results of tests; conclusions based on tests. 6 i.

Meeting Special Heating Needs When Main Plant Is Shut Down, by H. H. Angus.
No. 3. *March*, 1933. *p.* 144.
Central steam heats Toronto university buildings; heat needed at all times in a greenhouse and in a laboratory; hot-water converter, oil-fired auxiliary hot-water boiler used for former; control; oil-fired auxiliary steam boiler heats laboratory; control and operation. 2 i.

Planning a Central Heating Plant for a School or Institution, by Alfred Kellogg.
No. 4. *April*, 1933. *p.* 191.
Definition of district and central heating; problem of heating group of institutional buildings; buildings of various ages; types of building heating systems; modernization of the systems; locating boiler plant; choosing the type of boilers; selecting the fuel; purchase or generation of electricity; distribution of steam; types of conduits and tunnels; drainage. 10 i.

Planning a Central Heating Plant for a School or Institution, by Alfred Kellogg.
No. 5. *May*, 1933. *p.* 242.
The boiler house and stack; choosing the pipe material; planning distribution of steam; piping insulation; keeping steam on lines prolongs life. 4 i.

Central Steam Plant and Pipe Tunnels Keep Heating Costs Down at U. of C., by Charles Levin.
No. 2. *February*, 1933. *p.* 90.
Reasons for building new plant at University of Chicago; growth of heating load; tunnel waterproofed; sizing pipe; returning condensation from one-pipe gravity and two-pipe vacuum heating systems; removing condensation from lines; piping materials and insulation; expansion of piping. 7 i.

Efficiency of an Underground Steam Line, by William S. McLeish.
No. 3. *March*, 1933. *p.* 150.
(On the Job); underground steam distribution system at State Teachers Normal School, Ewing Township, N. J.; section tested for efficiency; results of test and recorded data.

Heating—Industrial

(Also See "Modernization")

Modern Unit Heaters Promote Effective Plant Heating with Economy.
No. 9. *September*, 1933. *p.* 445.
Advantages of unit heaters for modernizing plant heating systems; guide for determining suitability of unit heaters; maintenance guide for plant unit-heater systems; examples of actual installations, giving results; development in unit heaters. 7 i.

Plants Report Savings from Modernizing with Unit Heaters, by A. W. Moulder.
No. 7. *July*, 1933. *p.* 347.
Savings of 20 to 50 per cent reported; reasons for savings; installing strainers in supply instead of return connection to protect tubes.

The Modern Unit Heater a Production Aid.
No. 10. *October*, 1933. *p.* 510.
Unit heaters solve many "process problems"; humidifying units provide proper conditions for product (leather shoe sole plant); units replace pipe coils for lumber drying; units dispel fog and steam (dye-houses, etc.); units speed paint drying (truck bodies); miscellaneous applications. 4 i.

Unit Heaters Answer Many a Process Problem, by Laurin J. Zorn.
No. 5. *May*, 1933. *p.* 258.
(From an interview with Kimball Burr); unit dispels steam and vapor in Agar Packing and Provision Co. plant, Chicago; preventing condensation on walls; unit heater in smoke house; advantages obtained. 1 i.

Trapping Unit Heaters for Industrial-Plant Heating.
No. 11. *November*, 1933. *p.* 561.
The problems to be considered; effect of pressure on capacity; differential and working pressure; installation of traps; elimination of air; strainers and dirt pockets; valves; diagrams showing installation methods. 10 i.

Piping—General

The Status of Piping Standardization Today, by Sabin Crocker.
No. 9. *September*, 1933. *p.* 455.
Classification of piping standardization projects; dimensional standards; *American Standards Association; A. S. A.* standards already published; standards in preparation; steel flanged standard; adjusted service pressures for power piping below and above 750 F; possible method for establishing allowable service pressures at high temperatures (chart). 1 i.

Piping Standardization by Sabin Crocker.
No. 10. *October*, 1933. *p.* 500.
Wrought-iron and wrought-steel pipe standards; reasons for new standards; attacking the problem; use of the standard; proposed American tentative standard—wrought-iron and wrought-steel pipe (table); many formulas considered; dimensions and weights of lap-welded and Grade *A* seamless steel pipe for high-temperature service (table); boiler code pipe formulas; modified formula developed; comparison of internal-fluid-pressure formulas for pipes and cylinders (graph); wall thickness. 1 i.

Piping Standardization—Materials Specifications, by Sabin Crocker.
No. 11. *November*, 1933. *p.* 552.
Establishing a standard under *A. S. T. M.* procedure; *A. S. T. M.* specifications and their application to service; listing and explanation of materials specifications for piping (bolting, castings, forgings, pipe); application of various specifications.

Piping Standardization—Materials Specifications, by Sabin Crocker.
No. 12. *December*, 1933. *p.* 599.
National piping specifications other than *A. S. T. M.*; pipe for fusion welding; piping materials for service at temperatures up to 1100 F (bolts, pipe); properties of several alloy-steel piping materials suitable for operating temperatures above 750 F (table). 1 i.

Modern Equipment for Savings and Profit (Piping Developments are Numerous).
No. 1. *January*, 1933. *p.* 34.
Actual examples of modernization of industrial and building piping and recently-developed equipment; flow meters; valves; traps; welding and welding fittings; supports and expansion; piping materials; insulation; pumping equipment. 21 i.

Modern Maintenance Spots Waste in Piping, by W. H. Wilson.
No. 1. *January*, 1933. *p.* 19.
(On the Job); look for sources of waste, then repair and modernize; use of flow meters; utilization of condensate; check bypass valves for leakage; not always necessary to install bypass valves; returning condensate through overhead line. 3 i.

Supervision, Proper Equipment Save Time and Money in Piping Maintenance, by W. H. Wilson.
No. 11. *November*, 1933. *p.* 567.
Importance of careful supervision in piping maintenance work illustrated by example of replacement of an expansion joint; proper tools and equipment, including lighting; time-saving suggestions. 1 i.

Legalizing Beer Means Modernization of Old Breweries, by R. C. Doremus.
No. 1. *January*, 1933. *p.* 18.
Rehabilitation of old breweries; process largely steam cooking; modern plants want dry steam; flooded ammonia coolers finding favor; float control; unit coolers will find use; temperatures required in refrigerated cellars; piping must be properly designed.

Practical Notes on Pipe Welding, by Arthur E. Christen.
No. 3. *March*, 1933. *p.* 146.
Discussion of article describing welding piping in Field office building, Chicago, in August, 1932, issue; rolling of pipe being welded; manner of tack welding important; welding a valve and fitting assembly.

Welding Galvanized Piping.
No. 8. *August*, 1933. *p.* 413.
Electrolysis and galvanic corrosion; experiences with dissimilar metals in piping systems; cross-sections of fusion weld and bronze weld; what happens when galvanized pipe is welded. 1 i.

For Testing Castings, Forgings, Welds—Navy Used Rays from Radium, by Charles S. Barrett.
No. 4. *April*, 1933. *p.* 208.
Development of gamma-ray radiography by Naval Research Laboratory; nature of gamma rays; process of radiography with gamma rays; inspecting flanges in installed line, etc. 3 i.

Leak-Tight Joints—600 to 550,000 Lb.
No. 5. *May*, 1933. *p.* 247.
Comments on previous articles on leak-tight joints and reply by author, F. E. Wertheim; computing gasket pressures; "lock-head" type of joint for high pressure apparatus. 1 i.

Bad Threads and Their Cause, by W. H. Wilson.
No. 3. *March*, 1933. *p.* 150.
(On the Job); care of threading equipment and its operation to insure good pipe threads.

Tappings for Gage Piping, by W. H. Wilson.
No. 6. *June*, 1933. *p.* 73 (*adv. section*).
Importance of giving attention to gage- and other small-size piping; suggestions.

Piping—Process

Bernoulli's Theorem—What It Means, by J. C. Reed and E. E. Ambrosius.
No. 2. *February*, 1933. *p.* 111.
Bernoulli's work and his theorem; meaning of theorem explained; sketch of Bernoulli. 3 i.

The Flow of Fluids in Pipes, by Emory Kemler.
No. 5. *May*, 1933. *p.* 252.
Types of fluid flow; dimensional homogeneity; critical Reynolds' number; stream-line flow; analyses of turbulent flow data (method of analyzing data, smooth pipes, new steel pipes); conclusions; table of experimenters whose data are analyzed; charts showing test results for Reynolds' number and friction factor for flow in new steel pipes. 2 i.

The Flow of Fluids in Pipes, by Emory Kemler.
No. 6. *June*, 1933. *p.* 298.
Flow of incompressible fluids; pressure drop in a pipe; viscosity of the fluid; viscosities of several typical fluids (chart); three types of flow problems; examples; viscosity curve for typical lubricating oil; establishing friction factor for different pipes; friction factor curve for rough pipes (chart); when pipe is not circular. 4 i.

A Series of Charts to Simplify Flow and Pressure-Drop Calculations for Process Piping, by Emory Kemler.
No. 10. *October*, 1933. *p.* 513.
Charts simplify calculation of pressure-drop and flow of liquids of various specific gravities in pipe; allowing for roughening and accumulations; turbulent flow; example of use of charts. Full-page charts for 1-in. and 2-in. standard steel pipe; conversion chart for kinematic viscosity and viscosity in Saybolt seconds. 3 i. Chart for 1¼-in. standard steel pipe, page 555, November, 1933. Chart for 1½-in. standard steel pipe, page 606, December, 1933.

Newport Industries, Inc., Save Time and Money by Prefabrication of Process Piping, by E. F. Sisson.
No. 8. *August*, 1933. *p.* 397.
The process; involves considerable piping; prefabrication of

aluminum piping secures many economies; ten different pieces required; sketches of the required assembly pieces; piping welded; the savings. 1 i.

Piping Services in a Brewery.
No. 4. *April*, 1933. *p.* 200.
Atlas Brewing Co. plant, Chicago; the piping services required in a brewery; the beer-making process; bottling the beer; steam supply; water supply; compressed air. 7 i.

Pipe Welding Plays an Important Part in Modernizing Breweries, by F. W. Rabe.
No. 10. *October*, 1933. *p.* 509.
Applications of pipe welding in modernizing Anheuser-Busch brewery, St. Louis, Mo. (from a paper presented at meeting of the *International Acetylene Association*).

Runs Block-Tin Pipe in Steel Pipe, by George Hall.
No. 4. *April*, 1933. *p.* 205.
Specifications for Forest Products Laboratory, Madison, Wis., provided for distilled-water piping to be fully encased in steel piping; how job was done; tees. 1 i.

Oil Refining Process and Piping Explained by World's Fair Model.
No. 7. *July*, 1933. *p.* 340.
Model oil refinery at A Century of Progress. 1 i.

Designing Copper Gaskets for Hydraulic Piping.
No. 2. *February*, 1933. *p.* 88.
Comment on article "Gaskets and Packing for Hydraulic Power" (March, 1932, issue) by J. R. Dilley; F. E. Wertheim, author, replies; plastic properties of copper; compression tests of sheet copper; design of flanged joints; Baumann formula for expressing relations between the variables derived. 1 i.

Novel Control for Operating Pump, by Henry G. Schaefer.
No. 4. *April*, 1933. *p.* 205.
Control for operating pump for emptying blow-off or other closed tank has no float; operation depends on electro-magnet; construction and operation. 2 i.

Piping a Sand-Water Mix, by C. L. Mantell.
No. 2. *February*, 1933. *p.* 87.
Rubber-lined pipe used for filling mine with sand; analysis of the sand pumped; dimensions of the pipe; results. 3 i.

Piping—Refrigeration

How to Save by Modernizing Refrigeration Piping, by R. C. Doremus.
No. 4. *April*, 1933. *p.* 194.
Check-up of piping pays; two classes of refrigeration piping; match pipe surface to load; allow for all heat items; several room temperatures with one refrigerant temperature; length of piping per coil; too-long piping wasteful; scant pipe surface costs money; curves for pipe ratios in cu ft volume per lineal ft of 2-in. pipe for maintaining various temperatures in rooms with brine and direct expansion systems, and lineal ft of 1¼-in. pipe per ton of ice; tables for sq ft of direct-expansion coil surface per ton per day, brine pipe-coil surface per ton per day, maximum length one coil of ammonia direct-expansion piping, and maximum area indirect brine coil surface per valve. 3 i.

Some Practical Pointers on Modernizing Refrigeration Piping, by R. C. Doremus.
No. 6. *June*, 1933. *p.* 294.
Modernization of piping for conveying refrigerating water and brine; need for piping modernization; examples (ice-cream plant, chemical plant); fluid flow in pipe lines; friction chart for water; chart for brine. 2 i.

Checking up on Refrigeration Piping—Suction and Discharge Lines for Ammonia, by R. C. Doremus.
No. 9. *September*, 1933. *p.* 466.
Effects of increasing suction vapor pressure; effects of increasing discharge vapor pressure; practical limits; vapor velocities; sizing suction and discharge mains (tables); ammonia vapor velocity chart showing velocity range desirable; importance of correctly-sized piping. 1 i.

Brewery-Cellar Piping, by Robert S. Wheaton.
No. 12. *December*, 1933. *p.* 609.
Size of cellars; temperatures required; lay-out of refrigeration coils; typical jobs; arrangement and installation of coils. 2 i.

Hanging Thirty Miles of Brine Piping, by Robert S. Wheaton.
No. 2. *February*, 1933. *p.* 95.
(On the Job); concrete ceiling pitched sharply; engineer's level and rod used for determining length of hangers for ceiling coils. 1 i.

Large Refrigeration Piping Job, by Robert S. Wheaton.
No. 7. *July*, 1933. *p.* 341.
Ten miles of 2-in. piping for cold-storage job; the coils; installation; hook-up for brine coils. 1 i.

Thaws Rink Ice at Saving of $116 and 42 Hours, by Erwin L. Weber.
No. 3. *March*, 1933. *p.* 145.
Ice-thawing system for skating rink in Seattle Civic Arena; economic advantages; the rink; how ice-thawing system was designed; steel shell heater with copper coils heats brine; heat transfer rates, steam to brine; fuel saving. 1 i.

Piping—Steam, Air, Gas (including Steam for Process)

Heat Loss from Copper Piping, by R. H. Heilman.
No. 9. *September*, 1933. *p.* 458.
Transmission of heat from copper tube; emissivity of copper; emissivity coefficients for bare and lacquered copper surfaces at various temperatures (chart); comparison of tests; lacquering to prevent tarnishing increases heat loss; tests made on lacquering; economical thickness of insulation; tables for heat losses from horizontal bare copper pipe, copper tubes, and bare iron pipes. 1 i.

Graphic Solution of Some Common Pipe Bends, by Samuel Kameros.
No. 7. *July*, 1933. *p.* 342.
Charts simplify determination of stresses in pipe bends due to expansion; right-angle bend; simple U-bend; zee bend; expansion U-bend—equilateral type; expansion U-bend—optimum type; examples of use of curves; moment diagram; tables for moment of inertia and section moduli of pipe; linear expansion of steel pipe; modulus of elasticity at different temperatures. 7 i.

Detroit Edison Engineers Present Graphs for Design of Piping for Flexibility.
No. 8. *August*, 1933. *p.* 405.
Outstanding contribution to piping design is paper presented at semi-annual meeting of *A. S. M. E.*: "The Design of Piping for Flexibility by the Use of Graphs," by E. A. Wert, S. Smith, and E. T. Cope; summary of the paper; solution of a typical problem by the method. 3 i.

Expansion, Set of 400-Lb Piping Are Studied, by W. P. Palmer.
No. 3. *March*, 1933. *p.* 142.
Means provided for studying expansion and set of 400-lb, 750 F steam piping in power plant; results of study and movement of piping tabulated; rugged support takes care of piping vibration; anti-vibration support for boiler-feed piping. 3 i.

G. E.'s New Piping for 400-Lb 750-F Service Electric-Arc-Welded Throughout, by Robert Daniels.
No. 7. *July*, 1933. *p.* 354.
Steam piping system for conveying steam for heating, turbine-testing, and manufacturing from new mercury-steam-electric generating system at Schenectady, N. Y.; the plant; steam and return lines in tunnels; 14-in. seamless piping; installation of expansion joints; two types of pipe-carrying bridges; distribution of steam; insulation of lines; erecting pipe in tunnels; welding data and costs; regular production welders used. 8 i.

Industrial Piping Systems Pay Modernization Dividends, by A. W. Moulder.
No. 1. *January*, 1933. *p.* 3.
Life of piping limited; piping materials available; welding and welding fittings; supports; recent modernization of piping shows possibilities; 10 specific cases; old large piping replaced, heat loss cut; new overhead main installed; several deteriorated systems replaced; process hot water supplied economically; process and heating condensate returned to boilers; saves thousands on fuel by arranging for burning wood wastes; pipes spring water for air conditioning; replaces depreciated boilers, piping, etc.; old pipe coils taken out, unit heaters and controls put in. 5 i.

$750 for Piping Change Cuts Fuel Bill $2,300, by W. C. Gould and Francis A. Westbrook.
No. 1. *January*, 1933. *p.* 14.
Changes in piping, installation of pressure regulators, etc., cut cost of fuel for generating heating and high pressure steam at Beth Israel hospital, Boston, Mass.; factors influencing fuel saving; unaflow engine used for reducing steam pressure cuts power cost; arrangement of piping. 2 i.

Selection of Pressure Regulators, by Harold L. Colby.
No. 11. *November*, 1933. *p.* 565.
Over-sizing of pressure regulators: example; limitations of piping arrangement; choosing control point; preventing cutting action of condensate; general suggestions. 4 i.

Experts Discuss Valve Installation.
No. 2. *February*, 1933. *p.* 97.
(On the Job); comments and notes on installation of globe and angle valves in steam piping by J. B. Gibson, J. P. Ferguson, F. B. Corey, A. M. Houser and W. H. Wilson. 5 i.

Improved Piping Arrangement for Operating a Damper Regulator, by W. H. Wilson.
No. 5. *May*, 1933. *p.* 248.
Damper regulator controlled by steam pressure for controlling draft in furnace of boiler; location of connection to damper regulator; the piping. 1 i.

Forget Expansion; Trouble Results, by Bernard Kramer.
No. 3. *March*, 1933. *p.* 149.
(On the Job); nozzle on gas cooler cracks; cause; remedy; nozzle on gas reheater snaps off; cause; remedy. 2 i.

Modernization

(More specific articles on modernization will be found under the other headings.)

Modernization—An Opportunity for Savings and Profit.
No. 1. *January*, 1933. *p.* 1.
Modernization is good engineering; opportunities in air conditioning; real economies are possible in heating; the modernization of industrial piping pays; if modernization pays, modernize; how to plan for modernization.

Include in $3,300,000,000 Public Works Program the Modernization of Mechanical Equipment in Existing Properties.
No. 9. *September*, 1933. *p.* 450.
The plan, proposed by Russell Grinnell, and its advantages; proof of the soundness of the plan given by examples of specific properties by consulting engineers (Samuel R. Lewis, Walter E. Gillham, and Alfred Kellogg.

Public Works Modernization—Get Consulting Engineers on the Job.
No. 10. *October*, 1933. *p.* 497.
Need for facts on specific projects to get action; industry must take initiative; survey must be made; consulting engineers can do it; recovery act provides for modernization; modernization meets tests; set-up of Public-Works Administration; it is up to the industry.

Public Works Modernization Plan; Proper Effort Now Should Put It Over.
No. 11. *November*, 1933. *p.* 545.
Status of public works modernization plan; telegram from General Hugh S. Johnson on recovery of capital-goods industries; consulting engineers report modernization opportunities (specific examples reported by C. E. Daniel, C. P. Lichty, Wm. K. Robertson, Elliott Lee Ellingwood, F. H. Valentine, Perry West, and Dwight D. Kimball).

National Industrial Recovery Act Codes Indicate Need for Modernization.
No. 8. *August*, 1933. *p.* 393.
Many opportunities for modernization in heating, piping and air-conditioning services; should be considered by every plant executive.

Suggests Recovery Act Funds Be Used to Abate Smoke Nuisances.
No. 8. *August*, 1933. *p.* 401.
Memorandum by H. C. Murphy suggests use of federal funds to modernize plants and buildings to abate smoke nuisances; suggests municipal action.

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